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The Use of the Scottish Index of Multiple Deprivation as an Indicator to Evaluate the Impact of Policy on Widening Access to Higher Education

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Abstract

Policy on widening access to higher education in Scotland is defined mainly in terms of students who live in deprived areas as defined by the Scottish Index of Multiple Deprivation. Although area measures can be informative, and are convenient because they require only a postcode to classify any person into a deprivation category, they are crude. We use data from the Higher Education Statistics Agency, the Growing Up in Scotland Survey and the Scottish Household Survey to analyse the extent to which neighbourhood measures can be used as the basis of valid indicators of widening access. We conclude that they are flawed, although not wholly useless, and ought to be supplemented by more valid measures of students' social circumstances.

Keywords

Higher education; widening access; Scottish Index of Multiple Deprivation; social class.

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Introduction

Widening access to higher education in Scotland (and the rest of the UK) has been part of education policy since at least the Robbins report of 1963, but became more prominent as a consequence of the Dearing report in 1997 (National Committee of Inquiry into Higher Education, 1997). Around that time the monitoring of universities increased with the development of indicators. The Higher Education Statistics Agency (HESA) is responsible for collating and publishing data on universities including a range of performance indicators that relate to widening participation. Until 2016, this included data on young students' background based on parental occupation using the National Statistics Socio-Economic Classification (referred to below as NS-SEC or social class [1]). The series was discontinued because the data from it were considered not to be valid. The current measures used by HESA are POLAR3, an area-based measure for the UK except Scotland, and attendance at private or public-sector school (HESA, 2018). In Scotland the Scottish Index of Multiple Deprivation (SIMD), which is also an area-based measure, is used instead of POLAR3 and is published annually by the Scottish Funding Council (SFC). Although school attended provides an individual-level indicator it is a very blunt one because around 90% to 95% of UK-domiciled students attend public-sector schools. Further, there is much variation between public-sector schools in terms of the number of pupils who continue into higher education.

Our concern here is to examine the use of the Scottish Index of Multiple Deprivation (SIMD) to monitor the impact of widening access policy in Scotland. The paper notes its advantages, but also the potential perverse consequences of its use, by presenting data examining the relationship between SIMD, students' social background as measured by parental occupation (via NS-SEC), parental level of education, and household income. We use these other indicators to examine whether there are discrepancies between area-based and individual-level measures. We also consider whether there is a need to develop more robust ways of capturing individual-level data on students in order to ensure that policy measures reach those they are intended to reach.

The Scottish Index of Multiple Deprivation (SIMD) is an area-based measure which uses a person's postcode to determine whether they live in an area of high deprivation or in an area that is more affluent. SIMD draws on data from seven dimensions: employment, income, health, education (including skills and training), geographic access to services, crime, and housing. It groups almost 7,000 areas of 500-1000 people and ranks them according to level of deprivation, 1 denoting the most deprived and 6,976 being the least deprived. These local areas can then be grouped into fifths, with category 1 signifying the 20% most deprived areas and category 5 being the least disadvantaged.[2] SIMD has the advantage of being available for virtually all young entrants to university whose family home is in Scotland. But there are several problems with SIMD. It is not consistently an effective measure for students who have lived in care, and it is particularly difficult to interpret for entrants aged over 21 because their postcode does not necessarily reflect the area that they grew up in. The most extensive problem with the use of SIMD is that it does not necessarily reflect the personal circumstances of an individual nor is it effective in capturing rural poverty where the population is more widely dispersed (Shucksmith, 2003). It is the discrepancy between area-based and individual-level measures that we consider here.

The technical paper on measures and targets accompanying the Scottish Government's Commission on Widening Access report of March 2016 examined the use of indicators of entitlement to Free School Meals (FSM), or having attended a school with a history of low progression rates to university (Low Progression School or LPS). The paper concluded that: *'*despite its limitations, the Scottish Index of Multiple Deprivation is currently the most suitable measure of disadvantage for the purposes of measuring progress and setting targets' (p. 6). It did, however, note that 'additional measures like those identified above [FSM and LPS] can help with decisions about individuals …*'* (p. 6). A report by Boliver et al. (2017) for the Scottish Funding Council on the use of indicators examined a range of these, including SIMD 1 and SIMD 2. The purpose was to assist universities in operating contextualised admission, by which is meant taking account of, amongst other things, social disadvantage in deciding whom to admit. Boliver et al. provide evidence that is relevant when considering the impact of policy measures. They use the concepts of false positives and false negatives. False positives are individuals identified as disadvantaged when they are not; false negatives are those who are disadvantaged but not identified. Boliver et al. considered a much wider range of indicators than the Commission on Widening Access and recommended that SIMD 1 and SIMD 2 be used only as a supplement to other measures because using these on their own would result in some false positives. This point will be returned to in the conclusion.

There are two main sections to the present paper:

- The next section considers the extent to which the neighbourhood measure (SIMD) is a valid measure of the disadvantage faced by individual students. This section uses data from the Growing Up in Scotland survey and from the Scottish Household Survey.
- This is followed by an examination of the relationship between SIMD and NS-SEC among entrants to university over the period 2011-2015 using a bespoke dataset from the Higher Education Statistics Agency. The purpose of that analysis is to investigate the changing patterns of access to undergraduate higher education in terms of social class (NS-SEC) in a period when access policies were defined in terms of neighbourhood (SIMD). Did policies aimed at neighbourhoods benefit people who belonged to disadvantaged social classes? How, if at all, did that impact upon people whose own social class was not disadvantaged?

The paper concludes with some considerations of the implications of the results for policy on access to higher education.

Analysis of SIMD from Growing Up in Scotland and Scottish Household Survey

The question which we ask first is: how valid is SIMD as a measure of the social disadvantage faced by individual children? We use two surveys:

- *Growing Up in Scotland, sweep 6 of cohort 1, 2011*. This longitudinal survey follows a cohort of children born in 2005. In sweep 6 they were aged approximately 6.
- *Scottish Household Survey, 2016*. This is an annual survey of households in Scotland, collecting data on both the household as a whole and on a randomly selected individual within each household.

Further information on both these surveys is available at their web sites noted in the reference list.

The surveys are funded by the Scottish Government but are managed independently of government. They are conducted according to the UK Statistics Authority's Code of Practice for Official Statistics (UK Statistics Authority, 2019), and are widely recognised as definitive sources of independent evidence on Scottish society. The statistical variables used in the analysis are described in Appendix 1. We use both surveys because they provide somewhat different though overlapping measures of individual social circumstances. Growing Up in Scotland gives us measures of parental education and of social class (NS-SEC). The Scottish Household Survey gives the education of adults in the household, the social class of the household, and household income. Table A2 in Appendix 2 suggests that the surveys are broadly consistent with each other for households with children of the age included in Growing Up in Scotland.

Distribution of disadvantage

We consider first what kinds of neighbourhood contain disadvantaged children and households. This is shown in Tables 1a and 1b. Table 1a, from Growing up in Scotland, defines disadvantage as there not being an adult in the household who has higher education qualifications, or as the household's being in NS-SEC 5-7 or in the further category of 'long-term unemployed'. Table 1b, from the Scottish Household Survey, defines disadvantage as the randomly selected adult's not having a higher education qualification, or as the household's having a net annual income of less than £15,000. The interpretation of these tables may be illustrated by considering the top-left cell of Table 1a. It shows that 33% of all children in households where no adult has any higher education live in the 20% most deprived neighbourhoods.

Table 1
Distribution of disadvantage

(a) Growing Up in Scotland

Percentage in columns	No adult has higher education	No adult has degree	Household is in NS-SEC 5-8
SIMD 1 (most deprived 20%)	33	30	41
SIMD 2	24	24	26
SIMD 3	18	19	16
SIMD 4	16	17	13
SIMD 5 (least deprived 20%)	9	11	5
Sample size (no. children) (=100%)	1554	2097	882

(b) Scottish Household Survey (households with children)

Percentage in columns	Random adult has no higher education	Random adult has no degree	Household has low income
SIMD 1 (most deprived 20%)	33	30	49
SIMD 2	26	25	26
SIMD 3	17	17	11

SIMD 4	13	15	7
SIMD 5 (least deprived 20%)	12	12	7
Sample size (no. households) (=100%)	1119	1423	255

For definitions, see Appendix 1.

Tables 1a and 1b show similar patterns, despite coming from completely different surveys and providing information on different bases. For example, the proportions of disadvantaged households who live in the 60% least deprived neighbourhoods (SIMD 3-5) are:

no adult has higher education:	43% (i.e. 18+16+9 from Growing Up in Scotland in Table 1a. The analogous proportion in Table 1b is 42%)
no adult has a degree:	47% (from Table 1a; analogously, 44% from Table 1b)
household disadvantaged:	34% (from Table 1a; analogously 25% on low income in Table 1b)

In short, depending on how we measure disadvantage, between one third and nearly one half of disadvantaged children live in the least deprived areas. If we define deprived area more tightly, as the 20% most deprived, the percentage of disadvantaged children not living in deprived areas is between one half and two thirds (i.e. the people not in the first rows of these tables).

Advantage within disadvantaged neighbourhoods

A corollary of the analysis from Tables 1a and 1b is that deprived neighbourhoods contain many people who are not deprived according to any of the measures. This is shown in Tables 2a and 2b, which are defined analogously to Tables 1a and 4b. Having an income that confers advantage is defined here to be annual net household income greater than £30,000.

We can conclude from these two tables that, for example:

- 27-28% of children in the 20% most deprived neighbourhoods live in households containing an adult with a higher-education qualification. (The first of these percentages is from Table 2b (Scottish Household Survey) and the second from Table 2a (Growing Up in Scotland).)
- 26% of households in the 20% most deprived neighbourhoods have high income.

Thus these tables 1 and 2 show that measuring disadvantage in terms of the characteristics of neighbourhoods is very crude, especially if the purpose is to find children who cannot expect to have much advanced educational support from their parents. Children of graduates have educational advantages regardless of where their house is.

Table 2
Advantaged households in each category of neighbourhood
(a) Growing Up in Scotland

	At least one adult has higher education	At least one adult has degree	Household is in NS-SEC 1-2	Sample size (no. children) (=100%)
SIMD 1 (most deprived 20%)	28	13	21	613
SIMD 2	39	23	35	643
SIMD 3	54	38	50	742
SIMD 4	63	48	60	837
SIMD 5 (least deprived 20%)	77	66	78	821

(b) Scottish Household Survey (households with children)

	Random adult has higher education	Random adult has degree	Household has high income	Sample size (no. households) (=100%)
SIMD 1 (most deprived 20%)	27	15	26	446
SIMD 2	37	22	37	432
SIMD 3	52	37	61	407
SIMD 4	59	41	67	421
SIMD 5 (least deprived 20%)	70	59	77	406

For definitions, see Appendix 1.

Distribution of advantage

Finally in this section, we look at where the advantaged households are. This is shown in Tables 3a and 3b. For example, from the top-left cell of Table 3a, 12% of all children in households where at least one adult has some higher education live in the 20% most deprived neighbourhoods.

Table 3
Distribution of advantage
(a) Growing Up in Scotland

Percentage in columns	At least one adult has higher education	At least one adult has degree	Household is in NS-SEC 1-2
SIMD 1 (most deprived 20%)	12	8	9
SIMD 2	15	12	14
SIMD 3	20	19	20
SIMD 4	25	27	26
SIMD 5 (least deprived 20%)	29	34	31
Sample size (no. children) (=100%)	2102	1559	1987

(b) Scottish Household Survey (households with children)

Percentage in columns	Random adult has higher education	Random adult has degree	Household has high income

SIMD 1 (most deprived 20%)	13	10	12
SIMD 2	17	14	15
SIMD 3	20	20	20
SIMD 4	21	21	23
SIMD 5 (least deprived 20%)	29	35	29
Sample size (no. households) (=100%)	1022	718	1271

For definitions, see Appendix 1.

The proportion of advantaged households who live in the 40% most deprived neighbourhoods are (with first percentage in each category from Table 3a (Growing Up in Scotland) and the second from Table 3b (Scottish Household Survey):

at least one adult has higher education:	27-30%
at least one adult has degree:	20-24%
household is advantaged or has high income:	23-27%

That is, around one quarter of people who might expect to benefit from the advantages that their household enjoys would also be able to benefit from a widening-access policy that was targeted at deprived areas.

The relationship between SIMD and NS-SEC for entrants to university

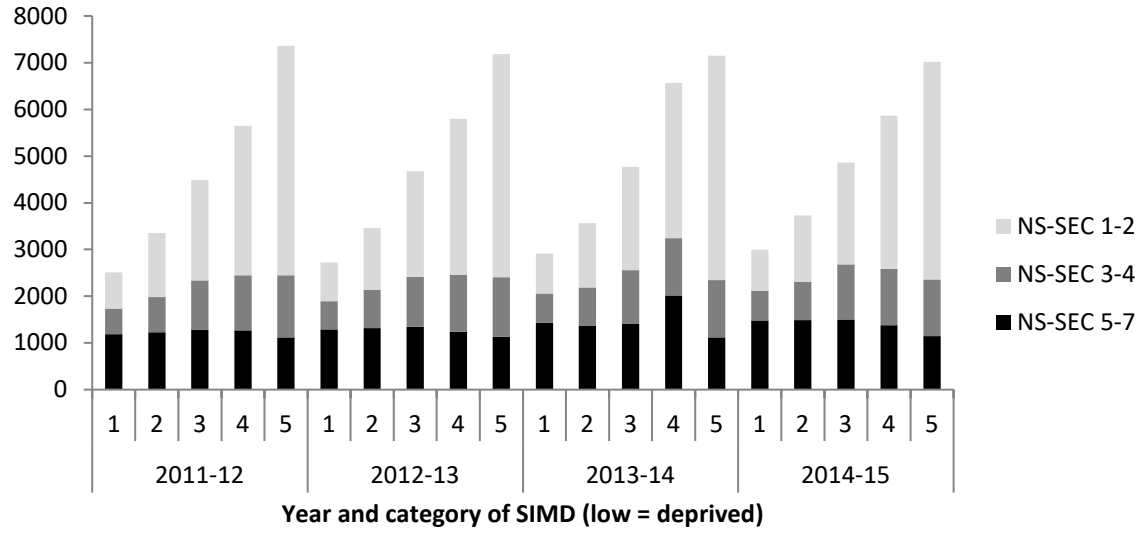
Now we turn to the main point of this article – the effects of the mismatch of disadvantage and neighbourhood deprivation on the policy of widening access to higher education. We are able to consider only entrants through the UCAS system, which means that we are considering almost entirely only entrants to higher education institutions. This has the unfortunate consequence of neglecting entrants to higher-education courses in further education colleges, who make up around a third of entrants to all undergraduate higher education in Scotland, although only about 1-2% of entrants to degree-level courses as distinct from HNDs and HNCs (Scottish Funding Council, 2018: Table 13). No public data base includes information on individual or household deprivation relating to these students.

The NS-SEC data collected until 2016 relied on students' interpretation of parental occupation and had a high number of missing cases. Even with that limitation, it provides a way to compare individual and area measures. The data used here divide students into three groups: NS-SEC 1-2 covers students from approximately the most socio-economically advantaged two-fifths of households by parental occupation, NS-SEC 5-7 approximately the most disadvantaged one third, and NS-SEC 3-4 those in between. (Endnote 1 and Table A2 in the appendix provide more detail.)

Figure 1 shows the distribution of NS-SEC categories in each SIMD category for entrants from 2011 to 2014. One of the most immediately striking findings is that people in the most *advantaged* class (NS-SEC 1-2) accounted for 30% of entrants from the most *deprived* SIMD 1. Entrants from households with most socio-economically disadvantaged occupations, NS-SEC 5-7, were distributed relatively evenly across the SIMD categories. Those from the most advantaged occupations, NS-SEC 1-2, despite being present from all deprivation categories, were by contrast strongly skewed towards the least disadvantaged areas.. Those in NS-SEC 3-4 were similarly skewed, but less

strongly so. The comparison shows again that the match between NS-SEC and SIMD is not exact, especially for the more disadvantaged households as defined by NS-SEC.

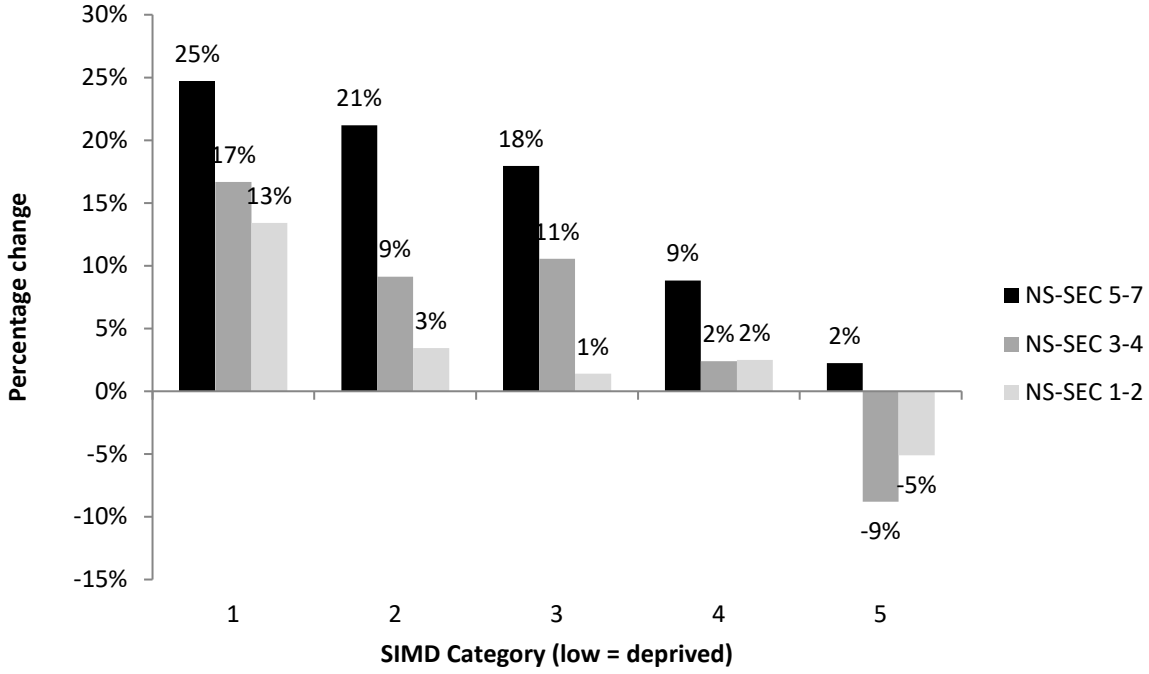
Figure 1
Number of first year full-time undergraduate entrants by NS-SEC group and SIMD category, 2011-12 to 2014-15



Source: HESA Student Record 2011/12 to 2014/15. Copyright Higher Education Statistics Agency Limited 2016

Figure 2 shows the change in the number of entrants by NS-SEC category and SIMD category over the period. The figures vary by SIMD category for each NS-SEC group. The three most deprived categories of area (SIMD 1-3) were particularly important in contributing to the increase of entrants from the most disadvantaged classes NS-SEC 5-7: their increase from these areas was much higher than from the other deprivation categories. The same is true for entrants from NS-SEC 3-4, which saw an absolute fall for the least deprived SIMD 5. Entrants from NS-SEC 1-2 from SIMD 5 also fell in number, though the proportionate fall was less. For this group there was little change in the middle SIMD categories, but in SIMD 1 the number of entrants from these most advantaged households grew strongly. The effect of being from a particular family occupational background therefore varied very substantially by area.

Figure 2
First year full-time undergraduates: percentage change in numbers by SIMD and NS-SEC 2011-12 to 2014-15



Source: HESA Student Record 2011/12 to 2014/15. Copyright Higher Education Statistics Agency Limited 2016

As a result, the change in numbers from particular SIMD areas does not simply reflect changes in the level of entry by individuals from more disadvantaged households. Examining the change in absolute numbers of entrants (not shown), one-fifth of the increase from SIMD 1 areas over the period was due to students from the managerial and professional occupations which constitute NS-SEC 1-2, while such students accounted for around only 70% of the absolute fall in entrants from SIMD 5.

Isolating the trend for NS-SEC groups from area data, Table 4 shows the distribution of first time, full-time entrants across NS-SEC categories each year in absolute numbers and as a share of all entrants, for the period 2011-12 to 2014-15. The percentage change over the period is also shown.

Table 4
Full-time first-time entrants to higher education 2011-12 to 2014-15.

	Numbers			Share of entrants		
	NS-SEC 5-7	NS-SEC 3-4	NS-SEC 1-2	NS-SEC 5-7	NS-SEC 3-4	NS-SEC 1-2
				%	%	%
2011-12	6077	4869	12415	26.0	20.8	53.1
2012-13	6325	4990	12524	26.5	20.9	52.5
2013-14	7344	5051	12567	29.4	20.2	50.3
2014-15	6996	5052	12425	28.6	20.6	50.8
% change	*15*	*4*	*0*	*10*	*-1*	*-4*

Source: HESA Student Record 2011/12 to 2014/15. Copyright Higher Education Statistics Agency Limited 2016

Change was not steady over the period within each group, but there was clear growth in the number of entrants from the most disadvantaged backgrounds (NS-SEC 5-7) and minimal change in NS-SEC 1-2, with NS-SEC 3-4 falling between the two. As a result, the share of entrants from NS-SEC 5-7 rose by 10% over the period, at the expense mainly of the share from NS-SEC 1-2, but also more modestly from NS-SEC 3-4.

The figures in Table 4 do not control for any changes in the NS-SEC composition of the population. For example, the fall in the share of entrants from NS-SEC 3-4 might be due to a fall in that class's share of the total population. It is possible to exclude any effects due to population-wide change by comparing the share of entrants with overall population share, although the comparison is inexact because our population data relate to all households with children, not just those with children at the usual age of entrance to higher education. The resulting distribution of households by NS-SEC in three groups is show in Table 5. (The full distribution of NS-SEC over this period is in Table A1 in Appendix 2; the question of whether the age of children matters in such calculations is discussed further below)

Table 5
All Scotland: distribution of households with children by NS-SEC in 3 groups 2008 to 2014

	NS-SEC 5-7	NS-SEC 3-4	NS-SEC 1-2
	%	%	%
2007-8	39	17	43
2009-10	38	19	44
2011	38	20	42
2012	37	19	43
2013	38	19	44
2014	38	18	44

Source: Scottish Household Survey (see Table A1).

None of the groups shows a steady trend, but the fluctuations largely reflect sampling error. (The sample sizes for these percentages are shown in Table A1.) For 2007-8 and 2009-10, the percentages are accurate to within about 1.3%; for the later years, they are accurate to within about 2%. There is certainly no evidence of any large changes in the class composition of the population of households with children.

Because students will be completing their applications and providing data in the year before entry, the relevant population baseline for entrants may be taken to be the NS-SEC distribution for the year before entry (that is, 2010 for 2011 entrants and so on). Table 6 shows the share of entrants as a proportion of the population by NS-SEC group. In 2011-12, entrants from NS-SEC 5-7 were under-represented, with 69% of the number of the entrants who would have been expected if entry was in parity with the population. Those from NS-SEC 1-2 were over-represented at 121%, as were those from NS-SEC 3-4, but less markedly. Over the following four years, these figures suggest that there was a substantial shift, with the least disadvantaged gaining share, the share for most advantaged falling and those in the middle also seeing a fall, albeit a smaller one. The estimates for NS-SEC 3-4 are particularly volatile, however, as seen by looking at 2012-13 and 2013-14.

Table 6
Share of entrants as a percentage of population share

	NS-SEC 5-7	NS-SEC 3-4	NS-SEC 1-2
	%	%	%
2011-12	69	113	121
2012-13	71	102	125
2013-14	79	104	117
2014-15	76	111	116
% change	*9*	*-1*	*-4*

Source: derived from HESA data in Table 1 and data from Scottish Household Survey in Table 2.

The results for all three groups are sensitive to the choice of year for the population baseline. Using instead the 2011 population for 2011 entrants, etc (not shown), the middle group sees a large percentage increase in its share of entrants (11%). This approach still gives a 10% increase in entrant share over the period for the most disadvantaged, while those from NS-SEC 1-2 see a larger drop (-9%).

The results for NS-SEC 5-7 do not allow any analysis of how growth in the most disadvantaged two-fifths of students has been distributed within that group, according to more precisely defined levels of disadvantage. To do that would require more disaggregated data from HESA.

These individual-level figures suggest that, over the period from 2011 to 2014, there was increased access for individuals from the one third or so most disadvantaged family backgrounds (NS-SEC 5-7), and that at least some of that was achieved by lower growth in numbers from the most socio-economically advantaged two fifths (NS-SEC 1-2). However, it is not clear that the most advantaged took the whole impact of growing numbers from NS-SEC 5-7: those from NS-SEC 3-4 also saw a declining share of entrants, although the results for them are very sensitive to choices about data, and which period is examined. Further, Figures 1 and 2 show that the general observation of changing NS-SEC entry shares masks strong area affects. Entrants from NS-SEC 1-2 in SIMD 1 saw a much larger increase than entrants from NS-SEC 5-7 in SIMD 4 or SIMD 5, and from NS-SEC 3-4 in any higher SIMD category.

This analysis shows the value of being able to look at individual and area measures together, to understand better who is benefitting from widening access policy and practical interventions. Unfortunately, with the discontinuation of HESA data on NS-SEC, and in the absence of any other available individual measure, there is no way to repeat this analysis for the period from 2016, after which access targets were introduced by the Scottish Government.

Conclusions

Our empirical conclusions do have to be read with the caveat that our data sources are not ideal for the purposes of measuring opportunity. The HESA information on entry to higher education relates only to higher-education institutions, not to higher education courses in further education colleges. It therefore underestimates the opportunities available to students from disadvantaged backgrounds, since the colleges are better at admitting such students than are the universities (Commission on Widening Access

2016: 23). Nevertheless, almost all degree-level study involves entering university at some point, and so access to university is itself an important instance of opportunity. The unreliability of the HESA data on social class will have had the effect of increasing the random errors of the classification, and so of reducing the measured differences between classes. So our estimates of the persisting class differences in access are probably underestimates.

Our two survey sources are of very high quality, but are limited in other ways. The data from Growing Up in Scotland relate only to the families which have a child aged 6. However, it is unlikely that the social-class composition would be much different for ages around 17-18, especially in the light of Table A1 from the Scottish Household Survey which shows that the class composition of the Scottish population of households with children has been quite stable since 2004. That the two surveys have broadly similar distributions of social class (Table A2) tends to confirm this point.

We can draw two broad empirical findings from the data analysis. One – from our first section – is about the distribution of disadvantaged and advantaged households across neighbourhoods. Depending on how we define disadvantage, between a half and two thirds of disadvantaged households are not in the 20% most deprived neighbourhoods. A large minority (around one quarter) of advantaged households live in deprived neighbourhoods. As a result, policies on widening participation in higher education which target special measures on deprived neighbourhoods potentially miss most students who ought to benefit, and include many students who, according to the remit of the widening-access schemes, ought not to benefit.

The other finding, from our second section, is that these problems are not merely potential. They are real, and are seen in the perverse way in which widening-access schemes confer even further advantages on already-advantaged students if they live in deprived neighbourhoods, and also provide no help at all to disadvantaged students who have the misfortune (for this purpose) not to live in deprived neighbourhoods. Overall participation in higher education has grown in all social classes. That it has grown most among students from disadvantaged households is a sign that the widening-access measures, though crude, are not without benefit. But the benefit is seen only for disadvantaged students in deprived areas. At the same time, advantaged students from these same areas have shown rising participation that can only be plausibly attributed to the neighbourhood-based schemes, because there has been no corresponding rise in participation by advantaged students from non-deprived areas.

Indeed, the main losers in this whole process have been advantaged students from non-deprived areas, whose numbers have actually declined. This decline has affected not only people from the most advantaged social classes but also people from middling groups

The problems which this analysis has shown could be dealt with by gathering a wider range of valid data. There is no reason why universities and colleges could not record more detailed information that would allow the social class of entrants to be defined in the rigorous way that is used in high-quality surveys of the kinds we have used. Information on other aspects of disadvantage could also be gathered, notably on whether the entrant's parents had high levels of education. There would then also be no reason why the government could not re-define the access targets to include measures of individual disadvantage. Neighbourhood measures would still have a place in a new range of indicators, because, as we have also shown, neighbourhood has an effect over

and above individual circumstances. But neighbourhood measures would be a supplement to those which more accurately reflect the harmful effects of social deprivation. It is, after all, individuals, not directly communities, who enjoy or are denied educational opportunity.

Appendix 1: variables used from the surveys

Growing Up in Scotland, sweep 6 of cohort 1, 2011

SIMD: this is derived in the variable ALFSNIM2, showing neighbourhoods classified by fifths of the distribution of deprivation. *Highest educational qualification*: derived from DFMEDU03 (which is respondent's highest qualification) and DFYEDU03 (which is respondent's partner's highest qualification, if there is a partner). 'Higher education' is categories 5 and 6 in these variables. 'Degree' is category 6 in these variables. Value -3 in the variables is set to missing (0.2% of all cases). *Household social class*: derived from DFMSEC10 (which is household status in NS-SEC; that in turn is derived as the higher status between respondent's status and respondent's partner's status if there is a partner). 'Advantaged' is category 1 in this variable, corresponding to professional and managerial occupations (NS-SEC 1-2). 'Disadvantaged' is categories 4, 5 and 6 in this variable, corresponding to lower supervisory, semi-routine and routine occupations, and never having worked (thus to NS-SEC 5-7 and never having worked) This results in the same classification as in the analysis of the HESA data. The percentages in the tables are weighted by DFWTBRTH. The sample sizes are unweighted.

Scottish Household Survey 2016

SIMD: this is recorded in the variable MD16QUIN, which shows neighbourhoods classified by fifths of the distribution of deprivation. *Households with children*: derived as categories 1, 2, 3 and 4 of the variable TOTKIDS. *Highest education qualification*: this is derived from HEDQUAL8 (which is the highest qualification of the randomly selected adult in the household). 'Higher education' is categories 3 and 4 in this variable. 'Degree' is category 4 in this variable. Missing values in the survey data base are retained as missing (8% of all cases). *Social Class*: this is derived from variable NSSEC2 (which is the social status of the randomly selected adult in the household, defined in terms of NS-SEC). 'Advantaged' is categories 1 and 2 of this variable, corresponding to professional and managerial occupations. This is exactly the same definition as for Growing Up in Scotland. 'Disadvantaged' is categories 5, 6 and 7 in this variable, corresponding to lower supervisory, semi-routine and routine occupations. This differs from the definition for Growing Up in Scotland in not including people who have never worked. People whose occupation could not be classified were not defined as missing in this variable. *Household income*: this is derived from TOTHINC (annual net household income). 'Low income' is defined to be categories 1, 2 and 3 of this variable (annual net household income of £15,000 or less). 'High income' is defined to be categories 7 and 8 of this variable (annual net household income over £30,000). Missing values in the survey data base are defined as missing (4% of all cases). The percentages in the tables are weighted by LA_WT in order to give estimates of the distribution of households. Thus the education variable described above is to be interpreted here as a description of the household even though derived from an individual. The sample sizes are unweighted.

Appendix 2: supplementary tables

Table A1
Household NS-SEC by year

Percentage in rows	I: Higher managerial and professional occupations	II: Lower managerial and professional occupations	III: Intermediate occupations	IV: Small employers and own account workers	V: Lower supervisory and technical occupations	VI: Semi-routine occupations	VII: Routine occupations	Sample size (=100%)
2004	11.8	32.9	8.4	8.3	13.6	12.4	12.6	3195
2006	9.9	33.2	8.2	7.9	14.5	13.8	12.5	7030
2008	13.7	29.5	8.4	9.0	14.1	13.5	11.7	5757
2010	15.7	28.2	8.8	9.7	13.8	13.1	10.6	6023
2011	16.0	26.0	10.8	9.7	10.9	14.3	12.4	2992
2012	13.8	29.4	11.0	8.4	11.0	14.7	11.7	2154
2013	14.1	29.6	11.0	7.6	11.3	14.4	12.0	2263
2014	13.1	30.9	10.5	7.8	11.7	14.1	11.8	2234
2015	14.1	30.1	10.2	7.5	11.9	14.7	11.4	2149
2016	14.7	31.2	8.3	9.0	10.4	14.7	11.7	2138
Total	13.4	30.2	9.2	8.6	13.0	13.8	11.8	35935

Source: Scottish Household Survey.

Unclassified excluded. Percentages weighted by LA-WT; samples sizes unweighted.

Households with children only (totkids ≥ 1). Class variables: nssec2 (2012-16), h_nssec2 (2006-11), h_nssec (2004). Until 2010, the survey ran in two-yearly cycles, with fieldwork spread over the year named in the table and the preceding year. NS-SEC was not recorded in the surveys of 2001-2 or 1999-2000.

Note on consistency of the two surveys

The Growing Up in Scotland data refer to 2011. Table A2 shows household NS-SEC for Scottish Household Survey 2011 (variable h_nssec2), using only households with children where the randomly selected adult is aged 27 or older (to exclude people who would be unlikely to be the parent of a child aged 6 in 2011). There is broad agreement, with perhaps a slight bias towards advantaged households in Growing Up in Scotland, probably reflecting differential attrition in the longitudinal Growing Up in Scotland sample.

Table A2

Household NS-SEC in 2011, Growing Up in Scotland and Scottish Household Survey

Percentage in columns	*Growing Up in Scotland*	*Scottish Household Survey*
I & II	49.0	44.5
III	14.6	11.1
IV	7.7	9.1
V	8.1	10.8
VI & VII	20.5	24.5
Sample size (=100%)	3617	2270

In the Scottish Household Survey, restricted to households with children where the randomly selected adult is aged 27 or older.

Never worked and unclassified are excluded.

Percentages weighted (as in earlier tables). Sample sizes unweighted.

Endnotes

[1] The version of NS-SEC used here groups people into 7 categories based on the nature of their employment. The categories (with the numbers used to refer to them in the text) are: 1: higher managerial and professional; 2: lower managerial and professional; 3: intermediate (eg clerical, sales, and service); 4: small employers and self-employed; 5: lower supervisory and technical; 6: semi-routine; 7: routine. The 8th category in this scheme ('never worked or long-term unemployed') is available from only some of our sources, as explained in the text.

[2] These fifths are often referred to as 'quintiles', but that is terminologically incorrect. The word 'quintile' refers correctly, not to the five categories, but to the dividing points between them in the SIMD scale.

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